

TWO NEW SPECIES OF *Pentelicus* HOWARD (HYMENOPTERA: ENCYRTIDAE) FROM SOUTHERN CHINA¹

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ABSTRACT: We describe two new species of *Pentelicus*, *Pentelicus orientalis* and *Pentelicus similis*, from southern China, the Oriental biogeographic region. Photomicrographs are provided to illustrate morphological characters of the new species. A key to worldwide species of *Pentelicus* is provided. All type specimens are deposited in Institute of Zoology, Chinese Academy of Sciences, Beijing (IZCAS).

KEY WORDS: *Pentelicus*, Hymenoptera, Encyrtidae, southern China, Oriental biogeographic region

Pentelicus Howard is a small genus in the Encyrtidae. Of the five recognized species of *Pentelicus*, *P. aldrichi* Howard (Howard 1895, Peck 1963, Gordh 1979), *P. confusus* (Ashmead) (Ashmead 1900, Peck 1963, Gordh 1979, Trjapitzin and Gordh 1979, Noyes and Hayat 1984) and *P. varicornis* (Girault) (Girault 1917, Peck 1963, Gordh 1979, Trjapitzin and Gordh 1979, Noyes and Hayat 1984) are distributed in the United States of America; *P. paliji* Khlopunov (Khlopunov 1979, Trjapitzin 1989) and *P. aeneifrons* (Girault) (Girault 1935, Noyes and Hayat 1984, Dahms and Gordh 1997) are known from the Palearctic and Australasian regions, respectively. Little has been known about biology of *Pentelicus* species except that McHugh (1993) recorded *Pentelicus* spp. as parasitoids of sphingid beetles (Coleoptera: Sphindidae).

Noyes and Hayat (1984) elucidated undetermined species of *Pentelicus* from Chinese Taiwan and India. In this paper, *P. orientalis* sp. n. and *P. similis* sp. n. are described from southern China as representatives of Oriental region. A key to all known species of *Pentelicus* is provided to facilitate species identification.

Morphological nomenclature follows Noyes and Hayat (1984), Huang and Noyes (1994). Absolute measurements are used for body length; relative measurements are used for other dimensions. All type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing (IZCAS).

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SYSTEMATIC ENTOMOLOGY
FAMILY ENCYRTIDAE
Genus *Pentelicus* Howard, 1895

Pentelicus Howard, 1895: 611. Type species: *Pentelicus aldrichi* Howard, by monotypy.

Hemaenasius Ashmead, 1900: 374. Type species: *Hemaenasius confusus* Ashmead, by monotypy and original designation. Synonymy with *Pentelicus* by Noyes and Hayat, 1984: 322.

Epaenasomyia Girault, 1917: 3. Type species: *Epaenasomyia varicornis* Girault, by monotypy and original designation. Synonymy with *Pentelicus* by Noyes and Hayat, 1984: 322.

Cowperella Girault, 1935: 4. Type species: *Cowperella aeneifrons* Girault, by monotypy. Synonymy with *Pentelicus* by Noyes and Hayat, 1984: 322.

Diagnosis. Female: Body robust, usually dark brown and with metallic green or purple blue sheen; frontovertex about 1/3 head width, with small or large piliferous punctures; occipital margin sharp; facial impression frequently carinate at top of antennal scrobes; antennal scape varying from cylindrical to strongly flattened and expanded; pedicel often clearly longer than the first funicular segment, rarely subequal in length; funicle 6-segmented; clava 3-segmented, with apex slightly to strongly obliquely truncated; mandibles tridentate; dorsum of thorax moderately convex, with shallow or deep piliferous punctures; posterior margin of mesoscutum often convex and axillae distinctly separated in dorsal view; scutellum with an discernable median longitudinal ridge, laterally and posteriorly flanged; forewing often with an infusate pattern, sometimes hyaline; linea calva posteriorly open; filum spinosum present; marginal vein punctiform or a little longer than broad; stigmal vein slightly to clearly longer than postmarginal vein; apex of stigmal vein and apex of postmarginal vein connected by a naked, hyaline streak (Fig. 2); gaster about as long as thorax; cercal plates located in basal half of gaster; hypopygium nearly reaching apex of gaster; ovipositor not or hardly exerted. Male: generally similar to female except antenna (Fig. 5) and genitalia (Fig. 6); apex of stigmal vein and apex of postmarginal vein without a naked, hyaline streak.

Remarks. As a result of the comprehensive study of Indo-Pacific Encyrtidae by Noyes and Hayat (1984), *Hemaenasius* Ashmead, *Epaenasomyia* Girault and *Cowperella* Girault are junior synonymies of *Pentelicus* (Dahms and Gordh 1997). All known species of *Pentelicus* possess a discernable median longitudinal ridge on scutellum, which is a possible autapomorphy of the genus. However, the systematics of this genus is yet unsettled. Historically, *Pentelicus* has been placed in the Bothriorhorini (Howard 1895, Trjapitzin and Gordh 1978, Trjapitzin 1989), Discodiini (as *Hemaenasius* in Trjapitzin and Gordh 1978). Noyes and Hayat (1984) stated *Pentelicus* is probably related to *Leurocerus* Crawford, *Proleurocerus* Ferrière, *Zozoros* Noyes and Hayat, etc. We refrain to give our opinion pending a further study of these genera.

***Pentelicus orientalis* sp. n.**

(Figs. 1-6)

Diagnosis. Female: body (length about 1.2 mm) dark brown; antenna (Fig. 1) generally dark brown except apex of scape, F6 and sometimes apex of F5 yellow; antennal scape about 3 times as long as broad; frontovertex with very shal-

low reticulate sculpture or smooth-like, and with piliferous punctures much smaller than diameter of posterior ocellus; mesoscutum and scutellum covered with scaly reticulate sculpture, and with shallow piliferous punctures, but apex of scutellum often smooth; forewing (Fig. 2) with about basal 1/3 infusate, the rest hyaline, sometimes faintly infusate subapically.

Description. Female: Body (length about 1.2 mm) dark brown, head with blue sheen, dorsum of thorax with blue-green sheen; antennae with scape generally dark except apex yellow; pedicel dark brown; funicle dark brown except F6 and sometimes apex of F5 yellow; clava dark brown; forewing with about basal 1/3 infusate, the rest hyaline, sometimes faintly infusate subapically; legs including all coxae generally dark brown except apices of all femora and tibiae, and all tarsi brownish yellow.

Head. Head in dorsal view, about 2.5 times as wide as its median length; ocelli forming an angle about 90°; posterior ocelli separated from occipital margin by about half their own diameters and from inner eye margin by 1/3 their own diameters; eyes oval and covered with translucent setae, which are clearly longer than diameter of a facet; head in front view, antennal toruli situated below lowest eye margin; antennal scrobes deep and jointed at top of interantennal prominence which is clearly convex; antenna (Fig. 1) with scape obviously expanded and flattened, about 3 times as long as wide; pedicel about two and a half times longer than wide; funicular segments gradually shortening distad, F1 nearly 1.5 times as long as broad and slightly longer than F2; F6 slightly transverse; clava apically conspicuously obliquely truncated and a little longer than F3-6 combined. Relative measurements: head width 46, median head length 18, head height 40, frontovertex width 16, POL 10, OOL 1, OCL 1.5, scape length 21, scape width 7, malar space 14.

Thorax. Mesoscutum and scutellum covered with reticulate sculpture, scattered with shallow piliferous punctures, but scutellum sometimes apically smooth; forewing (Fig. 2) slightly more than 2.1 times as long as wide; marginal vein punctate; postmarginal vein about twice as long as marginal vein and little shorter than stigmal vein. Relative measurements: mesoscutum width 42, mesoscutum length 20, scutellum width 28, scutellum length 25, forewing length 90, forewing width 42, marginal vein length 2.5, postmarginal vein length 5, stigmal vein length 6.

Gaster. Gaster a little shorter than thorax; cercal plate located in basal half of gaster; hypopygium extending to apex of gaster; ovipositor sheath (Fig. 3) slightly exerted. Relative measurements: gaster length 50.

Male. Body length about 1.1 mm; similar to female except as follows: antennal scape generally yellow or yellow brown, with dorsal and ventral margin dark brown; pedicel dark brown; flagellum dark yellow brown; forewing hyaline (Fig. 4); scape a little expanded and flattened, about 3 times as long as broad; pedicel short; all funicular segments longer than wide (Fig. 5); genitalia as in Fig. 6.

Host. Unknown.

Distribution. P. R. China-Anhui, Fujian, Guangxi, Hubei and Jiangxi provinces.

Type material. Holotype female mounted on card; P. R. China, Fujian, Fuzhou, 9.vi.2001, Leg. Nai-quan LIN (IZCAS). Paratypes: 2 females, 6 males, same data as holotype; 6 females, P. R. China, Anhui, Xuancheng, v.2003, Leg. Zhong-li SHA; 1 female, P. R. China, Guangxi, Jinxiu, 2.vii.2000, Leg. Chao-dong ZHU; 1 female, P. R. China, Hubei, Badong, alt. 1500 m, 11.viii.1989, Leg. Da-wei HUANG; 1 female, P. R. China, Jiangxi, Dayu, alt. 450 m, 14.viii.1985, Leg. Chang-fang LI (IZCAS).

Differential Diagnosis. *Pentelicus orientalis* is close to *P. aeneifrons* (Girault) but females can be separated from the latter by the following characters: body completely dark brown (generally orange in *aeneifrons*); antennal scape 3 times as long as broad (twice as long as broad in *aeneifrons*); funicle dark brown except F6 yellow and sometimes apex of F5 yellow (in *aeneifrons*, funicle whitish except F2 dark brown).

Pentelicus similis sp. n.

(Figs. 7-8)

Diagnosis. Female: Body (length about 1 mm) dark brown; antennal scape yellow, sometimes basally brownish yellow; pedicel generally dark brown except apex yellow; F1-4 brownish yellow, F5-6 yellow; antennal clava dark brown;

antennal scape cylindrical, 5 to 6 times as long as broad; frontovertex with distinct reticulate sculpture, and with small piliferous pits; mesoscutum and scutellum entirely covered with scaly reticulate sculpture, and with shallow piliferous punctures; forewing (Fig. 8) nearly entirely hyaline but for basal 1/6 or so infusate.

Description. Female: Body (length about 1 mm) dark brown, head and dorsum of thorax with blue-green sheen; antennal scape yellow, sometimes basally brownish yellow; pedicel generally dark brown except apex yellow; F1-4 brownish yellow, F5-6 yellow; antennal clava dark brown; forewing nearly entirely hyaline but for basal 1/6 or so infusate; legs similar to *P. orientalis* in color.

Head: Head in dorsal view, nearly 2.25 times as wide as its median length; frontovertex slightly less than 1/3 head width and covered distinct reticulate and sparsely with small piliferous punctures; ocelli forming an angle about 90°; posterior ocelli about 1/3 their own diameters from occipital margin and about the same from inner eye margin; antenna (Fig. 7) with scape cylindrical, 5 to 6 times as long as wide; pedicel about two times as long as wide; F1 about 1.2 times as long as broad, and about equal to F2 in length; F6 slightly transverse; clava apically conspicuously obliquely truncated and about as long as F3-6 combined. Relative measurements: head width 47, median head length 21, head height 39, frontovertex width 17, POL 10, OOL 1, OCL 1, scape length 21, scape width 4, malar space 13.

Thorax: Mesoscutum and scutellum covered with distinct reticulate sculpture, scattered with shallow piliferous punctures; forewing (Fig. 8) nearly 2.2 times as long as wide; marginal vein punctate; postmarginal vein about twice as long as marginal vein. Relative measurements: mesoscutum width 44, mesoscutum length 18, scutellum width 30, scutellum length 25, forewing length 100, forewing width 45, marginal vein length 2, postmarginal vein length 4, stigmal vein length 5.5.

Gaster: Cercal plate located in middle of gaster; hypopygium nearly extending to apex of gaster; ovipositor sheath hardly exerted. Relative measurements: gaster length 45.

Male: Unknown.

Host. Unknown.

Distribution. P. R. China-Fujian.

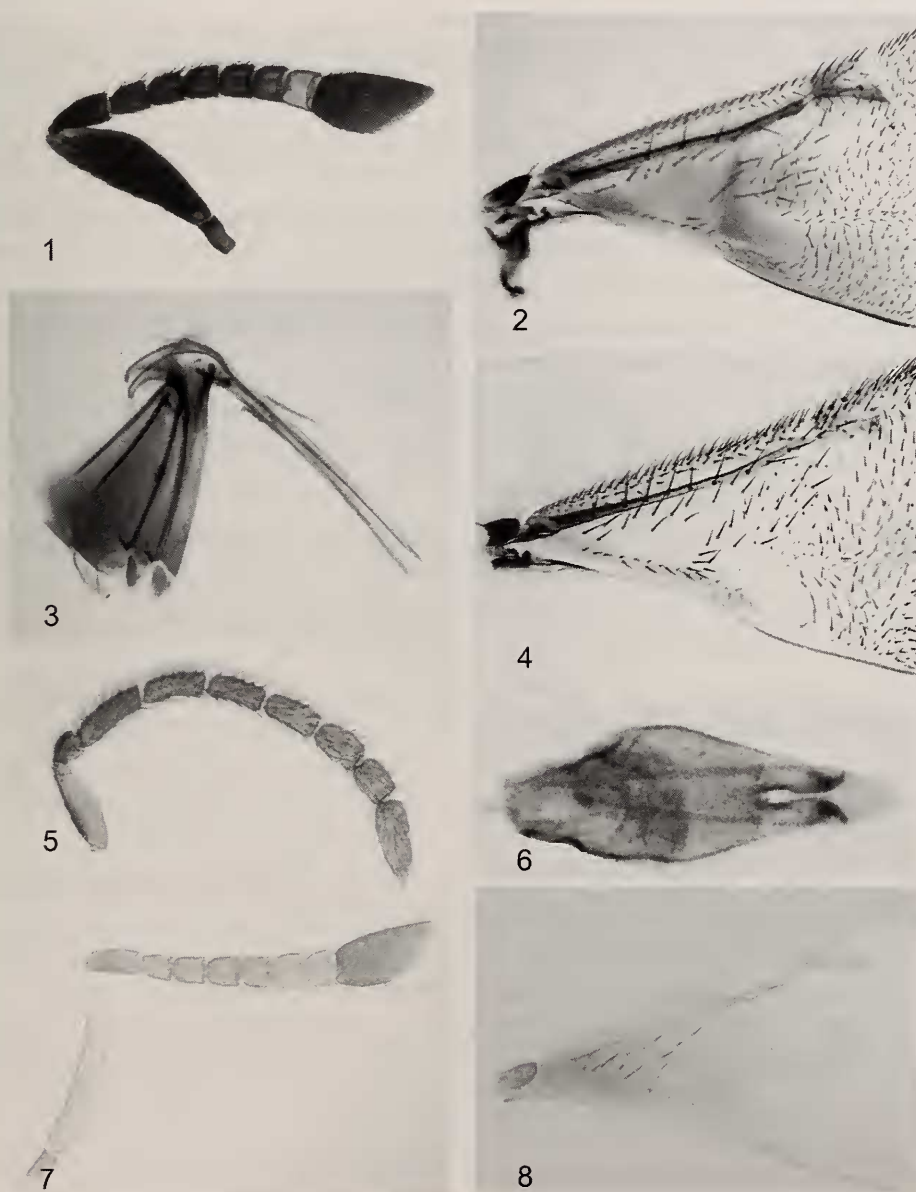
Type Data. Holotype female mounted on card, P. R. China, Fujian, Fuzhou, 20.vi.1997, Leg. Naiquan Lin (IZCAS). Paratype: 1 female mounted on card, the same data as holotype (IZCAS).

Differential Diagnosis. *P. similis* is very similar to *P. orientalis* but the females can be separated from the latter by the following characters: antennal scape cylindrical and 5 to 6 times as long as broad (antennal scape obviously flattened and expanded and about 3 times as long as broad in *orientalis*); scape yellow (scape nearly entirely dark brown in *orientalis*); forewing with basal 1/6 or so infusate (forewing with basal 1/3 or so infusate in *P. orientalis*).

Key to species of *Pentelicus*

- 1 Female; antennal clava 3-segmented and apically slightly to strongly obliquely truncated2
- Male; antennal clava appearing 2-segmented and apically pointed.....8
- 2 Frontovertex with large and deep piliferous punctures, which only slightly smaller than diameter of posterior ocellus; fore wing hyaline.....3
- Frontovertex with shallow piliferous punctures much smaller than diameter of posterior ocellus; fore wing at least basally infusate4
- 3 Funicle with F1 about as long as pedicel; clava about as long as F5-6 combined*P. aldrichi* Howard
- Funicle with F1 shorter than pedicel; clava about 1.7 times as long as F5-6 combined.....*P. paliji* Khlopunov
- 4 Antennal clava with apex distinctly obliquely truncated and the truncated part about half clava .. length5
- Antennal clava with apex more or less rounded or somewhat transversely truncated and the truncated part shorter than 1/3 clava length.....7
- 5 Body generally orange; antennal scape twice as long as broad*P. aeneifrons* (Girault)

- Body completely dark brown; antennal scape at least 3 times as long as broad6
- 6 Antennal scape about 3 times as long as broad (Fig. 1); forewing with at least basal 1/3 infusate (Fig. 2)*P. orientalis* sp. n.
- Antennal scape 5 to 6 times as long as broad (Fig. 7); forewing with basal 1/6 or so infusate ... (Fig. 8)*P. similis* sp. n.
- 7 Antennae with F1 yellow brown or dark yellow brown; forewing with basal infusate area not interrupted by hyaline stripe*P. confusus* (Ashmead)
- Antennae with F1 yellow; fore wing with basal infusate area interrupted by hyaline stripe*P. varicornis* (Girault)
- 8 Body length 2.5 mm; frontovertex with large and deep piliferous punctures, which only slightly smaller than diameter of posterior ocellus; antennal scape nearly 4 times as long as wide*P. pali* Khlopunov
- Body length 1.1 mm; frontovertex with shallow piliferous punctures much smaller than diameter of posterior ocellus; antennal scape 3 times as long as wide*P. orientalis* sp. n.



Figs. 1-8. 1-6, *Pentelicus orientalis* sp. n., 1. Antenna, female. 2. Forewing, female. 3. Ovipositor, female. 4. Forewing, male. 5. Antenna, male. 6. Genitalia, male. 7-8. *Pentelicus similis* sp. n., 7. Antenna, female. 8. Forewing, female.

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